

PATENT ABSTRACTS OF JAPAN

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(54) HUMIDIFICATION OF NATURAL GAS

(57)Abstract:

PURPOSE: To control the mixing ratio of a natural gas with a humidified natural gas, give an adequate humidity to the seals of gas pipes requiring the moisture and prevent the peeling of materials stuck to the inner surfaces of the pipes by humidifying a part of the natural gas in a humidification tower, mixing the humidified gas with the bypassed remaining part of the natural gas and subsequently measuring the dew point of the mixed gas.

CONSTITUTION: In a process for supplying a city gas using a natural gas, a part of the natural gas as the raw material is guided into a humidifying tower and subsequently saturated with moisture. The humidified gas is mixed with the remaining natural gas bypassed the humidification tower. The dew point of the mixed gas is measured, and the mixing ratio is controlled on the basis of the measured value, thus humidifying the natural gas.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the humidification approach of the natural gas in a town gas supply process.

[0002]

[Description of the Prior Art] Town gas means the gas used as a fuel in a common private house, and the component has various things. although coal gas was in use in the dawn of town gas industry, a current gas company increases -- taking -- the -- since [geographical and property-], various gas, such as petroleum gas, natural gas, and butane air, is used.

[0003] However, in a large firm, it is shifting to natural gas from the reasons of the certainty of raw material reservation, the stability of cost, reduction of a manufacturing cost, etc. Of course, although natural gas is desirable also in a minor firm, the present condition is that an installation cost etc. becomes immense and is not made easily. Then, in the minor gas company contiguous to the firm of others which use a big gas company and natural gas etc., supply of natural gas is received from there and how to supply it to a consumer from its company can be considered.

[0004] According to this approach, since the expensive tank for deep-freezing of natural gas and an acceptance facility become unnecessary, operation is easy. Of course, conversion of gas fittings is required though natural. Since conversion of this instrument is needed when changing sharply the description of the gas supplied in case of what kind of approach, it cannot be said to be a fault.

[0005]

[Problem(s) to be Solved by the Invention] However, there are the following troubles by this approach. In the minor gas company which is doing business for many years, the still very old conduit exists in the city. Since problems, such as corrosion, to the quality of the material is a casting and, as for this, can do neither welding nor a screw cutter, the connection has been based on the so-called pillbox mold joint. This prepares a socket in one tube end, and inserts and connects the tube end of another side. In order to make it airtight, **** etc. is stuffed into the clearance, it twists firmly, and lead is cast, or cement is slushed and connected.

[0006] By this approach, if it is important that **** etc. holds moisture and this dries in order to maintain an airtight, seal nature will be lost. In conventional town gas, since it is rinsing before supply and a considerable quantity (it is the saturation content of that temperature when many) of moisture was included in gas, this **** did not dry and moderate moisture was maintained.

[0007] However, when this becomes natural gas, it is a dry gas without **** moisture also with almost sufficient perfect *****. this -- a conduit -- if it passes through inside, **** will dry completely, seal nature is lost and there is a danger that gas will be revealed. moreover, desiccation -- a conduit -- the object which has adhered inside exfoliates, and with gas, a centrifugal spark advancer and gas fittings are reached and it becomes the cause of failure of equipment and an instrument.

[0008] Then, in this industry, when it converts into natural gas from the gas containing the conventional moisture, all such [in the long run] pillbox joints will be abolished, but since the conduit of shopping quarter in the city etc. was not immediately able to be exchanged, even if it used the conventional conduit in the short term, the approach to twist the above danger was demanded.

[Means for Solving the Problem] In view of the above present condition, the place by which this invention person used to make complete this invention approach wholeheartedly as a result of research, and it is characterized [the] It leads to a column. the town gas supply process using natural gas -- setting -- a part of raw material natural gas -- humidification -- this humidification -- moisture is saturated in a column -- making -- humidification -- the raw material natural gas and this humidification gas of the remainder which made the column bypass are mixed, the dew-point after mixing is measured, and it is in the point which controls mixing percentage by the value.

[0009] Natural gas means the gas which used methane as the principal component.

[0010] humidification -- a column may be equipment which gives moisture to gas and what kind of thing is sufficient as the configuration and structure. What carries out the spray of the water from a top from the bottom like a scrubber to the flowing gas is good. However, the thing of the type which only blows gas into water can also be used. Since adjustment of water absorption here is difficult, it gives water altogether to an excess and is saturated mostly. And mixing with the dry gas from a bypass line adjusts a coefficient of water absorption. This is one description of this invention and is the reason which makes this invention equipment easy and cheap.

[0011] a bypass -- humidification -- the ** which does not pass through a column -- humidification -- a column -- being mixable with outlet gas -- saying -- this bypass line -- a flow control valve -- preparing -- humidification -- the ratio of the flow rate of a column and a bypass line is adjusted. What is necessary is for the dew-point of mixed gas just to determine this ratio. Namely, in below a predetermined dew-point, the opening of a bypass valve is decreased, and the dew-point of mixed gas should just increase opening, when reverse.

[0012] how to decide a predetermined dew-point -- the atmospheric temperature at that time, and a conduit -- it changes with extent of an inner pillbox joint etc. Naturally, it is not necessary to also control this dew-point by one point, and it will be satisfactory if it is predetermined within the limits. The upper limit in that case is the problem of dew condensation of the moisture in gas. That is, since the problem of corrosion and the problem of freezing will arise if the moisture in gas dews, it must be below the dewing temperature. Therefore, it usually sets up lower several degrees C than the atmospheric temperature at that time.

[0013] moreover, the point of **** of a pillbox joint drying a minimum and losing seal nature or a conduit -- it is determined in the point that an inside affix exfoliates. Therefore, the dew-point more than fixed is needed. Consequently, it will operate between the upper limit decided from the above mentioned dew condensation, and the minimum decided from seal nature etc. However, it is satisfactory whichever it exceeds a limit in the short term. Because, even if it exceeds an upper limit, since a pressure falls so that it approaches the consumer of an end, a dew-point becomes lower, and even if it exceeds a minimum, a problem is not produced to seal nature in the short term.

[0014] When an example of a minimum and an upper limit is shown, in summer, it is 2 degrees C - about 5 degrees C in 5 degrees C - about 15 degrees C and a winter season. Of course, since atmospheric temperature differs, it is made to change in Hokkaido or Kyushu, as it was balanced. It is abbreviation when this is said with a moisture content. Although it becomes a 2.5 - 3.5 g/N cube meter grade, it changes neither with large atmospheric temperature nor supply pressures, and this invention is not limited by the moisture content as this described above.

[0015]

[Example] Next, this invention approach is explained more to a detail based on an example. Drawing 1 is a general flowsheet which shows one example of equipment 1 which enforces this invention approach. first, raw material natural gas is divided into humidification Rhine 2 and a bypass line 3 -- having -- humidification Rhine 2 -- humidification -- a column 4 is formed and the bypass valve 5 is formed in the bypass line 3. humidification -- a mixer 6 (this may be performed for piping) is formed in the appearance side of a column 4, and humidification gas and a dry gas are mixed here. A dew-point instrument 7 is formed in the downstream of a mixer 6, and the valve element driving gear of a bypass valve 5 is being interlocked with. moreover, humidification -- in the column 4, in order to increase the touch area of water and gas, the layer of packing 8 is prepared. water -- from a spray nozzle 9 -- blowing off -- humidification -- a column -- it stores in the lower part and circulates with a pump 10. Moreover, in order to compensate the moisture accompanied into gas, the inlet port 11 of a waterworks is formed. The supply valve 12 is formed in the inlet port of a waterworks, and this is controlled by the numeric value of the level gage of the water currently stored.

[0016] first, raw material natural gas is divided into humidification Rhine 2 and a bypass line 3 -- having -- humidification -- in a column 4, gas is saturated with moisture and faces to a mixer 6. Then, it is mixed with a dry gas and a dew-point is measured with a dew-point instrument, and when a dew-point is more than predetermined, it will be said that opening of a bypass valve is enlarged.

[Effect of the Invention] According to this invention approach, while it also adjusts a dew-point for moisture moderate to the natural gas of a bone dry simply, it can give. By it, the seal piece of a pillbox joint is prevented and exfoliation of dust etc. is also prevented. For this reason, leakage of gas, and GABA and instrument failure of gas can mitigate greatly. Adjustment of the moisture content to apply is very easy, and does not need to control the amount of the water added to gas.

[Translation done.]